PIONEER 10
72-012A-00H

PIONEER 11
73-019A-00G

TRAJECTORY DATA - SFDU FORMAT

REQ. AGENT	ACQ. AGENT
CMW	JFC

PIONEER 10

72-012A-00H

TRAJECTORY DATA - SFDU FORMAT

This data set consists of 2 magnetic tapes. The tapes were written on 9-track, 6250 bpi, in SFDU format, and can be read with the VAX COPY command in VMS directory format. The first two files on the tape contains the volume description and the file format. These are followed by the data files. All data records are of the same length, 512 ASCII characters or bytes per physical record. The C tapes are 3480 bpi. The D and C numbers and time span are as follows:

D#	C#	FILES	TIME SPAN
D-085883	C-029141	39	04/06/73 - 01/01/1990
D-108359	C-032396	23	01/01/90 - 01/01/2000

REQ. AGENT	ACQ. AGENT
CMW	JFC

PIONEER 11

73-019A-00G

TRAJECTORY DATA - SFDU FORMAT

This data set consists of 2 magnetic tapes. The tapes were written on 9-track, 6250 bpi, in SFDU format, and can be read with the VAX COPY command in VMS directory format. The first two files on the tape contains the volume description and the file format. These are followed by the data files. All data records are of the same length, 512 ASCII characters or bytes per physical record. The C tapes are 3480 bpi. The D and C numbers and time span are as follows:

D#	C#	FILES	TIME SPAN
D-085884	C-029142	37	04/06/73 - 01/01/1990
D-108360	C-032397	23	01/01/90 - 01/01/2000

CCSD3ZF0000100000001CCSD3VS00002MRK**001

VOL_IDENT: USA_NASA_NSSD_P10Z_0002
VOL_CREATION_DATE: 1995-07-11
MEDIUM_DESCRIPTION: 1/2-inch, 9-track, 6250 bpi magnetic tape
TECHNICAL_CONTACT: David W. Lozier
NASA Ames Research Center (Mail Stop 244-14)
Moffett Field, CA 94035

Electronic Mail: David_Lozier@QMGATE.ARC.NASA.GOV
Telephone: 415-604-3147
PREV_VOLS: USA_NASA_NSSD_P10Z_0001

CCSD$$MARKERMRK**001CCSD3SS00002MRK**002

DATA_SET_NAME: PIONEER 10 TRAJECTORY EPHEMERIS ARCHIVE (Extension to 2000)
DATA_SOURCE: Pioneer 10 trajectory data were generated using the Jet Propulsion Laboratory's (JPL) "Double Precision Trajectory" (DPTRAJ) computer program, an element of the JPL Navigation Software System, reference (A).

DPTRAJ creates a spacecraft ephemeris by integrating the equations of motion for a full set of acceleration models. For the Pioneer 10 trajectory ephemeris, DPTRAJ integration was limited to the N-body gravitational terms (planets, Sun and Moon) with Earth oblateness, Jupiter oblateness (J2 and J4), and a simple solar pressure model included.

Initial conditions for the DPTRAJ runs were obtained from various Orbit Determination (OD) solutions performed during the mission. A set of seven spacecraft initial state vectors (position, velocity and epoch) was compiled to cover all phases of the mission from launch to 1 January 1990 (Volume USA_NASA_NSSD_P10Z_0001).

(1) Launch to second midcourse maneuver
(2) Second midcourse maneuver to first "IO" targeting maneuver
(3) First "IO" targeting maneuver to second "IO" targeting maneuver
(4) Second "IO" targeting maneuver to Jupiter phase
(5) Jupiter encounter OD
(6) Jupiter encounter to 1983 solar escape
(7) 1983 solar escape to 1 January 1990

A complete set of input for the seven DPTRAJ runs is provided in reference (B).

This volume extends the Pioneer 10 trajectory from 1 January 1990 to 1 January 2000.

The DPTRAJ input for volume USA_NASA_NSSD_P10Z_0002 is provided in reference (D).

SCIENTIFIC_CONTACT: none
SPACECRAFT_CHARACTERISTICS: Pioneer 10 is a 550 pound spin stabilized spacecraft powered by four RTGs. Communications with the Earth is provided by a 9 ft. diameter parabolic high gain antenna located on the spin axis of the spacecraft. Periodic precession maneuvers are performed to maintain Earth pointing of the high gain antenna. The spacecraft

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FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.3.5   -- INNOVATION DATA PROCESSING  AUTHORIZED  10/02/95   PAGE   1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES

FATAR CONTROL CARDS

   1--     ANALYZE BLP,LABELS=NO,PRTLEN=2000
   2--       PRINT LF=1,B=1-29
   3--       PRINT LF=2,B=1-47
   4--       PRINT LF=3,B=1-5
   5--       PRINT LF=22,B=15-24
   6--       PRINT LF=23,B=1-4

FATS071 TAPE BUFFER SIZE IS 65535 BYTES

                                  CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                          UNIT  SERIAL  DEN  TRTCH
                                           5B5  CMS20   38000

                                            FATAR DETAIL REPORT

 BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL   BLOCK TYPE                        (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)


* * * * * * *  START FILE       1

       1   495  PRINT REQUESTED                CCSD3ZF0000100000001CCSD3VS00002MRK**001        VOL_IDENT: USA_NASA_NSSD
        +00080                    _P10Z_0002    VOL_CREATION_DATE: 1995-07-11    MEDIUM_DESCRIPTION: 1/2-inch, 9-t
        +00160                    rack, 6250 bpi magnetic tape    TECHNICAL_CONTACT: David W. Lozier       NASA Am
        +00240                    es Research Center (Mail Stop 244-14)       Moffett Field,  CA   94035
        +00320                        Electronic Mail: David_Lozier@QMGATE.ARC.NASA.GOV       Telephone:  415-604-
        +00400                    3147    PREV_VOLS:  USA_NASA_NSSD_P10Z_0001        CCSD$$MARKERMRK**001CCSD3SS00
        +00480                    002MRK**002

       2   460  PRINT REQUESTED                 T      DATA_SET_NAME:  PIONEER 10 TRAJECTORY EPHEMERIS ARCHIVE (Extension to
        +00080                                                          2000)    DATA_SOURCE:  Pioneer 10 trajectory data were
        +00160                    generated using the  |                                  Jet Propulsion Laboratory's (JPL
        +00240                    ) "Double Precision +                                Trajectory" (DPTRAJ) computer pro
        +00320                    gram, an element        of the JPL Navigation Software System, reference (A).
        +00400                          DPTRAJ creates a spacecraft ephemeris by integrating

       3   454  PRINT REQUESTED                 F         the equations of motion for a full set of acceleration       models.
        +00080                     For the Pioneer 10 trajectory ephemeris, DPTRAJ       integration was limited t
        +00160                    o the N-body gravitational        terms (planets, Sun and Moon) with Earth oblat
        +00240                    eness,       Jupiter oblateness (J2 and J4), and a simple solar        pressure
        +00320                    model included.             Initial conditions for the DPTRAJ runs were obtained
        +00400                          from various Orbit Determination (OD) solutions

       4   455  PRINT REQUESTED                 G         performed during the mission.  A set of seven spacecraft       initia
        +00080                    l state vectors (position, velocity and epoch)       was compiled to cover all p
        +00160                    hases of the mission from       launch to 1 January 1990 (Volume
        +00240                                  USA_NASA_NSSD_P10Z_0001).                                    (1) Launch
        +00320                    to second midcourse maneuver                                  (2) Second midcourse ma
        +00400                    neuver to first "IO"                  targeting maneuver

       5   469  PRINT REQUESTED                 N                                (3) First "IO" targeting maneuver to
        +00080                         second "IO" targeting maneuver                                        (4) Second "IO"
        +00160                    targeting maneuver to                    Jupiter phase
        +00240                    (5) Jupiter encounter OD                                      (6) Jupiter encounter to 1
```

FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR VER 4.3.5 -- INNOVATION DATA PROCESSING AUTHORIZED 10/04/95 PAGE 1

FATS070 CONTROL CARD TABLE SIZE IS 4096 BYTES

FATAR CONTROL CARDS

DC-029141

Twin Span 04/06/73 - 01/01/90

```
   1--     ANALYZE BLP,LABELS=NO,PRTLEN=9000
   2--       PRINT LF=ALL,B=1-5,CHAR
```

FATS071 TAPE BUFFER SIZE IS 65535 BYTES

CHARACTERISTICS OF THE TAPE TO BE ANALYZED

UNIT	SERIAL	DEN	TRTCH
5B2	CMS22	38000	

FATAR DETAIL REPORT

```
BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
NUMBER DISPL   BLOCK TYPE                    (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

* * * * * * *  START FILE       1

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

      1    80  PRINT REQUESTED          VOL1TRJP10                                D%B44440010011                                  3

      2    80  PRINT REQUESTED          HDR1VOLDESC.SFD      TRJP1000010001000100 92056 92056 000000DECFILE11A

      3    80  PRINT REQUESTED          HDR2D0051200512                                    00

      4    80  PRINT REQUESTED          HDR300000A020000000000010000000000000000000000000000000000000000000000000

* * * * * * *  END OF FILE       1  -- FILE CONTAINED       4 BLOCKS

* * * * * * *  START FILE       2

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

      1   512  PRINT REQUESTED          0044CCSD3ZF000010000000001CCSD3VS00002MRK**00100040038VOL_IDENT: USA_NASA_NSSD_P10
       +00080                          Z_00010033VOL_CREATION_DATE: 1991-12-060065MEDIUM_DESCRIPTION: 1/2-inch, 9-track
       +00160                          , 6250 bpi magnetic tape0038TECHNICAL_CONTACT: David W. Lozier0051   NASA Ames R
       +00240                          esearch Center (Mail Stop 244-14)0033   Moffett Field, CA   940350007   0040
       +00320                          Electronic Mail: Span OPS::LOZIER0026      NASAMAIL/DLOZIER0031   Telephone: 41
       +00400                          5-604-31470022      FTS 464-31470020PREV_VOLS:  none00040044CCSD$$MARKERMRK**001
       +00480                          CCSD3SS00002MRK**0020004--------

      2   512  PRINT REQUESTED          0059DATA_SET_NAME:  PIONEER 10 TRAJECTORY EPHEMERIS ARCHIVE0070DATA_SOURCE:  Pio
       +00080                          neer 10 trajectory data were generated using the 0079                          Jet
       +00160                           Propulsion Laboratory's (JPL) "Double Precision0078                          Traj
       +00240                          ectory" (DPTRAJ) computer program, an element 0060   of the JPL Navigation Softw
       +00320                          are System, reference (A).00040059   DPTRAJ creates a spacecraft ephemeris by in
       +00400                          tegrating0061   the equations of motion for a full set of acceleration----------
       +00480                          --------------------------------

      3   512  PRINT REQUESTED          0063   models.  For the Pioneer 10 trajectory ephemeris, DPTRAJ0059   integratio
       +00080                          n was limited to the N-body gravitational 0059   terms (planets, Sun and Moon) w
       +00160                          ith Earth oblateness,0058   Jupiter oblateness (J2 and J4), and a simple solar 0
       +00240                          032   pressure model included. 00040059   Initial conditions for the DPTRAJ runs
       +00320                           were obtained0055   from various Orbit Determination (OD) solutions 0063   perf
```

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FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.3.5   -- INNOVATION DATA PROCESSING  AUTHORIZED  10/04/95  PAGE   1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES

FATAR CONTROL CARDS

   1--     ANALYZE BLP,LABELS=NO,PRTLEN=9000
   2--       PRINT LF=ALL,B=1-5,CHAR

FATS071 TAPE BUFFER SIZE IS 65535 BYTES

                                CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                        UNIT  SERIAL  DEN  TRTCH
                                         5B2  CMS23   38000

                                          FATAR DETAIL REPORT

 BLOCK  LNGTH/  MESSAGE/                  1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL   BLOCK TYPE                          (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

* * * * * * *  START FILE       1

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

      1    80  PRINT REQUESTED          VOL1TRJP11                                D%B44440010011                                3

      2    80  PRINT REQUESTED          HDR1VOLDESC.SFD      TRJP1100010001000100 92057 92057 000000DECFILE11A

      3    80  PRINT REQUESTED          HDR2D0051200512                                    00

      4    80  PRINT REQUESTED          HDR300000A020000000000010000000000000000000000000000000000000000000000000000

* * * * * * *  END OF FILE       1  -- FILE CONTAINED       4 BLOCKS

* * * * * * *  START FILE       2

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

      1   512  PRINT REQUESTED          0044CCSD3ZF0000100000001CCSD3VS00002MRK**00100040038VOL_IDENT: USA_NASA_NSSD_P11
       +00080                          Z_00010033VOL_CREATION_DATE: 1991-12-060065MEDIUM_DESCRIPTION: 1/2-inch, 9-track
       +00160                          , 6250 bpi magnetic tape0038TECHNICAL_CONTACT: David W. Lozier0051   NASA Ames R
       +00240                          esearch Center (Mail Stop 244-14)0033   Moffett Field,  CA   940350007   0040
       +00320                          Electronic Mail: Span OPS::LOZIER0026      NASAMAIL/DLOZIER0031   Telephone:  41
       +00400                          5-604-31470022      FTS 464-31470020PREV_VOLS:  none00040044CCSD$$MARKERMRK**001
       +00480                          CCSD3SS00002MRK**0020004--------

      2   512  PRINT REQUESTED          0059DATA_SET_NAME:  PIONEER 11 TRAJECTORY EPHEMERIS ARCHIVE0069DATA_SOURCE:  Pio
       +00080                          neer 11 trajectory data were generated using the0079                          Jet
       +00160                          Propulsion Laboratory's (JPL) "Double Precision0077                         Traje
       +00240                          ctory" (DPTRAJ) computer program, an element0081                          of the J
       +00320                          PL Navigation Software System, reference (A).00040080                        DPT
       +00400                          RAJ creates a spacecraft ephemeris by integrating--------------------------------
       +00480                          ----------------------------------

      3   512  PRINT REQUESTED          0082                                the equations of motion for a full set of accelerati
       +00080                          on0084                                models.  For the Pioneer 11 trajectory ephemeris,
       +00160                          DPTRAJ0079                               integration was limited to the N-body gravitat
       +00240                          ional0080                               terms (planets, Sun and Moon) with Earth oblate
       +00320                          ness,0083                               Jupiter oblateness (J2 and J4), Saturn oblatene
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FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.3.5   -- INNOVATION DATA PROCESSING  AUTHORIZED  10/02/95   PAGE   1
FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES
FATAR CONTROL CARDS
   1--    ANALYZE BLP,LABELS=NO,PRTLEN=2000
   2--      PRINT LF=1,B=1-31
   3--      PRINT LF=2,B=1-47
   4--      PRINT LF=3,B=1-5
   5--      PRINT LF=22,B=15-24
   6--      PRINT LF=23,B=1-4
FATS071 TAPE BUFFER SIZE IS 65535 BYTES

                                   CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                            UNIT  SERIAL  DEN  TRTCH
                                             5B5  CMS21   38000

                                              FATAR DETAIL REPORT

 BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL   BLOCK TYPE                        (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

* * * * * * *  START FILE      1

     1   495   PRINT REQUESTED                  CCSD3ZF0000100000001CCSD3VS00002MRK**001        VOL_IDENT: USA_NASA_NSSD
      +00080                            _P11Z_0002    VOL_CREATION_DATE: 1995-07-11    MEDIUM_DESCRIPTION: 1/2-inch, 9-t
      +00160                            rack, 6250 bpi magnetic tape    TECHNICAL_CONTACT: David W. Lozier        NASA Am
      +00240                            es Research Center (Mail Stop 244-14)        Moffett Field,  CA   94035
      +00320                                Electronic Mail: David_Lozier@QMGATE.ARC.NASA.GOV        Telephone:  415-604-
      +00400                            3147    PREV_VOLS:  USA_NASA_NSSD_P11Z_0001          CCSD$$MARKERMRK**001CCSD3SS00
      +00480                            002MRK**002

     2   500   PRINT REQUESTED           4      DATA_SET_NAME:  PIONEER 11 TRAJECTORY EPHEMERIS ARCHIVE (Extension to
      +00080                                                     2000)    DATA_SOURCE:  Pioneer 11 trajectory data were
      +00160                            generated using the |                            . Jet Propulsion Laboratory's (JPL)
      +00240                             "Double Precision (                               Trajectory" (DPTRAJ) computer prog
      +00320                            ram, an element                                 of the JPL Navigation Software System
      +00400                            , reference (A).      &                              DPTRAJ creates a spacecraft ephe
      +00480                            meris by integrating

     3   466   PRINT REQUESTED           K                                  the equations of motion for a full set of accele
      +00080                            ration                                 models.  For the Pioneer 11 trajectory ephemer
      +00160                            is, DPTRAJ |                               integration was limited to the N-body grav
      +00240                            itational &                               terms (planets, Sun and Moon) with Earth ob
      +00320                            lateness,                                 Jupiter oblateness (J2 and J4), Saturn obla
      +00400                            teness (J2),       and a simple solar pressure model included.

     4   461   PRINT REQUESTED                &                             Initial conditions for the DPTRAJ runs were obta
      +00080                            ined .                              from various Orbit Determination (OD) solutions
      +00160                                                           performed during the mission.  A set of eleven
      +00240                            .
                                         spacecraft initial state vectors (position, velocity        and epoch) was comp
      +00320                            iled to cover all phases of the         mission from launch to 1 January 1990 (vo
      +00400                            lume                                USA_NASA_NSSD_P11Z_0001).

     5   508   PRINT REQUESTED                                                   (1) Launch to first midcourse maneuver
      +00080                                                           (2) First midcourse maneuver to second
      +00160                                                       midcourse maneuver ◊                                 (3) Se
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DC-033397
Time Span 1/1/90 – 1/1/2000